



Aegis Ballistic Missile Defense (Aegis BMD)

Mission

The Aegis BMD element of the Ballistic Missile Defense System (BMDS) builds upon the mature, operationally-proven, globally deployed Aegis Combat System (ACS) to detect, track, intercept, and destroy Short Range Ballistic Missiles (SRBMs) to Intermediate Range Ballistic Missiles (IRBMs) in the midcourse (including ascent and early terminal) phase of flight while deployed in defense of the nation, deployed U.S. forces, friends, and allies.

Program Description

Aegis BMD is being developed through the evolution of the highly capable Aegis Weapon System (AWS), the Standard Missile family and existing BMC4I systems.

The changes in the AWS are focused on improvements to the SPY-1 radar signal processor and the Weapons Control System to perform exo-atmospheric engagements. To intercept a ballistic missile, it must be detected at longer ranges and higher altitudes than conventional air targets. For separating missiles, the Reentry Vehicle (RV) or warhead must be identified and tracked among numerous, closely spaced missile components. The radar also guides the Standard Missile-3 (SM-3) to the target and performs post intercept kill assessment. SPY radar computer program changes are needed to increase the search and track volume of the radar and to employ programmable energy waveforms. Computer program changes are necessary in the Weapons Control System to support the SM-3 in an engagement and to develop an interface with the guided missile.



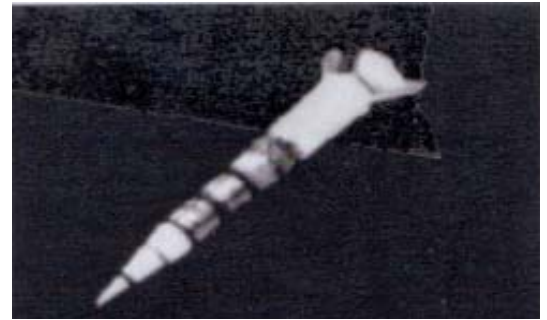
TTV-3 Launch

The SM-3 evolves from the proven SM-2 Block IV design. SM-3 uses the same booster and dual thrust rocket motor as the Block IV missile for the first and second stages and the same steering control section and midcourse missile guidance for maneuvering in the atmosphere. To support the extended range of an exo-atmospheric intercept, additional missile thrust is provided in a new third stage for the SM-3 missile, containing a dual pulse rocket motor for the early exo-atmospheric phase of flight and a Lightweight Exo-Atmospheric Projectile (LEAP) Kinetic Warhead (KW) for the intercept phase. Upon second stage separation, the first pulse burn of the Third Stage Rocket Motor (TSRM) provides the axial thrust to maintain the missile's trajectory into the exo-atmosphere. Upon entering the exo-atmosphere, the third stage coasts. The TSRM's attitude control system maneuvers the third stage to eject the nosecone, exposing the KW's Infrared (IR) seeker. If the third stage requires a course correction for an intercept, the rocket motor begins the second pulse burn. Upon completion of the second pulse burn, the IR seeker is calibrated and the KW ejects. The KW possesses its own attitude control system and guidance commands are acted upon by a solid divert propulsion system. The IR seeker acquires the target. Tracking information is continuously transmitted to the guidance assembly which controls the divert propulsion system.

The KW maneuvers to intercept the target based on data from the IR seeker, destroying it with the shear force of impact.

Aegis BMD Block 2004

To fulfill the sea-based portion of the initial missile defense capabilities, the MDA is developing Aegis BMD in close coordination with the Navy and Naval Sea Systems Command. Aegis BMD Block 2004 consists of two major contributions to BMDS. The first contribution is Aegis DDG-51 Class Destroyers equipped for Long Range Surveillance and Track (LRS&T). LRS&T provides a capability to detect and track LRBMs and to report the track data to the BMDS. This capability assists in the sharing of tracking data to cue other BMDS sensors and provides fire control support to engagement elements. LRS&T is the first Aegis BMD delivery and is part of the Initial Defensive Operations (IDO), which will go on alert later this year. The second contribution is Aegis CG-47 Class Cruisers equipped with the LRS&T capability, but also armed with the new SM-3, capable of intercepting short and medium range ballistic missile threats in the midcourse phase of flight. By 2005, full Aegis BMD Block 2004 functionality will be implemented in the first set of Aegis Cruisers. In the future, Aegis BMD capability will evolve to defeat longer range ballistic missiles.



KW Seeker Track

Deployment

As part of the initial deployment of the BMDS, five Pacific Fleet Aegis Destroyers will have operational LRS&T upgrades installed by the end of this year. There will be a total of 15 LRS&T Aegis Destroyers and 3 Aegis BMD engagement Cruisers by the end of CY 06.

International Partnerships

The potential for allied cooperation in development and procurement of a BMD system is real. In December 2003, through a formal Cabinet Decision, the Government of Japan became our first ally to decide to proceed with the acquisition of a multi-layered BMD system, basing its initial capability on upgrades of its Aegis Destroyers and acquisition of the SM-3 missile. The first Aegis BMD installation in the Japan Maritime Self Defense Force is scheduled for the fall of 2007. In addition, Japan will upgrade their Patriot units with PAC-3 missiles and improved ground support equipment.

We have worked closely with Japan since 1999 to design and develop advanced components for the SM-3 missile. This project will culminate in flight tests of SM-3 variant missiles in 2005 and 2006.